Chapter 4 – Monitoring

Monitoring

This chapter describes the monitoring that would be required for the South Shore project. The purpose of project monitoring is to track the implementation of the resource protection measures found in Chapter 2 and the prescribed BMPs (Appendix B), and in some cases, to measure their short-term effectiveness at protecting resources. If unacceptable impacts are identified through monitoring, measures would be taken to mitigate impacts and adapt management techniques to protect resources as described in the resource sections below. Project resource protection measures are detailed in Chapter 2 and not duplicated in this section (e.g. operable soil moisture conditions , WS-21).

Types of Monitoring

Implementation monitoring consists of visual monitoring of project treatment areas, roads, stream crossings, landings, etc., to ensure that all management practices and project resource protection measures (termed "design features" in the DEIS) are implemented, including those designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, riparian buffers, waterbars, critical dips) are in place as prescribed.

Effectiveness monitoring consists of visual monitoring to evaluate the effectiveness of the prescribed resource protection measures and management practices at meeting their objectives. It includes evaluating the effectiveness of management practices designed to prevent sediment delivery and protect water quality (e.g., erosion control measures, riparian buffers, waterbars, critical dips).

Organization of Chapter 4

Chapter 4 describes the monitoring that is required specific to the South Shore project. A discussion of differences between alternatives is organized by resource area and described when there would be a change in required monitoring based on a difference between the action alternatives. The monitoring requirements are separated into specific resource areas for ease in reading in the following order:

- Soil, Water and Riparian Resources Monitoring
- Aquatic Resources Monitoring
- Transportation Monitoring
- Sensitive Plant Monitoring
- Invasive Weed Monitoring

The best management practices (BMPs) referred to in the following discussion are found in Appendix B, with a short description.

Soil, Water and Riparian Resources

Required Monitoring

SEZ Pile Burning

The resource protection measures (aka design features) (Chapter 2) for pile burning in SEZs under both action alternatives are new to the Lake Tahoe Basin, and their effectiveness at protecting soil and water quality in SEZs has not been quantified. For the first two years after piles are burned, monitoring would be used in a representative sample of SEZ pile burn units to determine whether the resource protection measures were successful in avoiding significant impacts to soil stability, soil productivity, water quality, and riparian plant growth. Monitoring would be implemented for up to 2 years after piles are burned. If the monitoring efforts or visual observations of SEZ areas indicate ash or sediment delivery to a surface water occurs, season of burning may be changed, piles may be moved further from channels, or another comparable mitigation measure may be used to prevent the delivery of piled or burned material to surface waters.

BMP and Resource protection measure Implementation

Implementation monitoring would occur in each treatment unit (or group of similar nearby units), and in other areas affected by the South Shore project such as access roads, staging areas, water supply areas, etc. This would include completing a checklist that includes BMPs and resource protection measures contained in the NEPA document that apply to soil and water quality protection. The checklist would require visits to the treatment units before, during and after implementation to ensure that BMPs and resource protection measures are carried out on the ground as they were prescribed. If implementation monitoring indicates a deficiency in completing all required BMPs and resource protection measures, the contract administrator would be notified and the contractor would be required to take corrective action (whether that is to fix the deficiency where found, or to discuss how to properly implement the BMP or resource protection measure in the future).

Implementation monitoring for select BMPs would also occur prior to a large storm event (1 inch or greater forecasted). A watershed or transportation specialist would review project BMPs and notify the contract administrator if additional BMPs are recommended to disconnect runoff from surface water features.

BMP Evaluation Program

Best management practice evaluation program (BMPEP) protocols developed by the USFS and CA State Water Resources Control Board (USDA FS 2002) would be followed to provide qualitative information about whether BMPs are implemented as prescribed in the NEPA document (and subsequent contract and permit requirements and specifications) and that they are effective in protecting soil and water resources. Regionally, targets are set for each forest (including the LTBMU) identifying how many of each type of evaluation should be completed each year. The South Shore proposed treatment units and roads would be included in the pool of randomly selected BMPEP evaluations to meet this target. In addition to the Regional targets, this program requires use of the Prescribed Fire (F25) protocol for up to 5 underburns per year..

Additional BMPEP Monitoring

The DEIS described different triggers for additional BMPEP monitoring than what is described below. However, the timber waiver has now been revised for projects initiated in 2009 or later. Based on comments received from the public, the Lahontan Water Board, and the TRPA, the

selection criteria for sites for additional BMPEP evaluations have been revised to be consistent with the latest Timber Waiver revision. The LTBMU and Lahontan Water Board concluded that modifying the additional monitoring triggers, using other criteria instead of reliance only on modeled CWE results, would be more consistent with the 2009 Timber Waiver monitoring requirements, and would provide a higher confidence level for evaluating the effectiveness of the resource protection measures and BMPs for the project.

The following methods would be used to select monitoring sites for additional BMPEP evaluations to comply with the revised Timber Waiver language for 2009, rather than using the CWE results to make this determination.

Focused high risk BMP monitoring would be completed annually at stream crossings and SEZ boundaries to verify and document that protection measures are implemented as prescribed and that they are effectively protecting soil and water quality. The focused "high risk" BMP evaluations would be done in addition to those required to meet the BMPEP regional targets in order to comply with 2009 Timber Waiver attachment O, and would be done in stands adjacent to streamside management zones and at stream crossings (BMPEP Protocols T01, E09, and E14). Photos would be taken for documentation of "not effective" ratings. Corrective actions would be prescribed as necessary to correct documented deficiencies, and repeat evaluations would be conducted until deficiencies have been corrected.

If sites beyond the regional target are available each year, the T01 protocol would be followed at 1 to3 additional streamside management zones (i.e., SEZs) present within treatment stands. Sites for this monitoring would be selected based on the potential that project activities may affect soil or water quality, such as proximity of treatments to perennial channels, lakes and ponds, and the presence of steep slopes.

The E09 BMPEP protocol would be followed at each permanent stream crossing replacement (3 total) and at the single intermittent stream crossing that would remain in place over winter. This protocol would be completed at 3 points in time: during installation, after the first major storm event (1 inch, 24 hour storm) and after spring runoff the year following crossing installation.

Finally, the E14 protocol would be followed at 1 to 5 temporary road stream crossings (as available each year) within the treatment stands immediately after installation, after storm events (1 inch or greater) during their use,, and to monitor temporary road stream crossing removal immediately after the crossing is removed and after the first winter season. Ephemeral channel crossings would be selected for this monitoring based on the presence of riparian vegetation, slope, and their proximity and connectivity to intermittent or perennial channels.

Forensic Monitoring

In addition to the detailed monitoring described above, forensic monitoring would be conducted whenever visual observations from the project IDT, Contract Administrator, the public, or regulatory agency staff identify a soil or water quality resource concern. This monitoring would involve evaluation of the resource concern from a watershed specialist, identification and application of corrective actions where needed, and repeated monitoring until the concern has been resolved. When safety of employees is of concern, monitoring would occur as soon as conditions are safe.

Aquatic Resources

Required Monitoring

Stream Temperature and Shade

The objective of fuel treatments in SEZs (along or adjacent to perennial flowing tributaries) is to have no measurable increase in stream temperature as a by-product of conifer removal. Therefore, the critical monitoring question is, will the decrease in density of live conifers result in a decrease in stream shade and a measurable increase in stream temperature?

Monitoring parameters would include: a) selection of a minimum of 6 SEZ treatments (2 whole tree units, 2 cut-to-length units, and 2 hand thinning units), b) installation of 3 temperature loggers associated with each unit type, c) locate temperature monitoring sites above, within and below each selected unit and d) measurement of stream shade at each temperature monitoring location and at two points equidistant between stream temperature monitoring locations.

Stream data loggers record water temperatures during a normal spring to fall flow cycle (May – November) which would encapsulate pre- and post-fuels treatment conditions. Stream temperature would be recorded for 1 – 2 years depending on when units are treated. The following table summarizes the stream temperature monitoring parameters.

Table 4-1. Stream Temperature Monitoring Temperatures (May-November)

WHOLE TREE			CUT TO LENGTH			HAND THIN		
Unit No.	**No. of SEZ Acres**	**No. of Data Loggers**	**Unit No.**	**No. of SEZ Acres**	**No. of Data Loggers**	**Unit No.**	**No. of SEZ Acres**	**No. of Data Loggers**
9	21.63	UU – 1 IU – 1 DU – 1	133/135	1.06	UU – 1 IU – 1 DU – 1	99/56	1.24	UU – 1 IU – 1 DU – 1
192	3.90	UU – 1 IU – 1 DU – 1	343	9.72	UU – 1 IU – 1 DU – 1	82/84	0.10	UU – 1 IU – 1 DU – 1
Unit 22 (alternate)	0.03	UU – 1 IU – 1 DU – 1	186/187 (alternate)	0.20	UU – 1 IU – 1 DU – 1	95 (alternate)	0.11	UU – 1 IU – 1 DU – 1
UU = Upstream of unit IU = Inside the unit DU = Downstream of the units					**TOTAL NO. OF DATA LOGGERS = 18** **TOTAL NO. OF SITES = 6**			

Transportation

Required Monitoring

The mechanism for monitoring and documenting the implementation of all transportation resource protection measures and BMPs would be the implementation monitoring checklist, previously described under the Soils, Water, and Riparian Resource section of this chapter. In addition, Transportation (Roads and Access) BMPs would be included in the sampling pool for the Regional BMPEP program each year.

Some elements of the South Shore Project will require a Storm Water Pollutions Prevention Plan (SWPPP) or Erosion Control Plan (ECP), depending on the required level of permitting. The SWPPP and ECP may include additional monitoring elements required by the permitting agency.

Sensitive Plants and Fungi

Required Monitoring

Sensitive plant monitoring is an ongoing forest-wide program conducted regularly with results reported to the National Resource Information System (NRIS) database. Project Sensitive plant monitoring would occur under this program and not specific to the South Shore Project. A regionally designated fungi monitoring plot exists within the project area. No detections of sensitive fungi have occurred. This plot is monitored periodically and no additional monitoring is required for the South Shore Project.

Invasive Weeds

Required Monitoring

The invasive weed monitoring process would occur similar to monitoring described above for sensitive plants. Invasive weed monitoring is an ongoing forest-wide effort conducted regularly with results reported to the NRIS database. This information is used to help determine effective application of project resource protection measures and potential treatment options. Project invasive weed monitoring would occur under this program and not specific to the South Shore Project.